1853MNRAS..13..216S

Extract of a Letter from Sig. Secchi to Captain R. H. Manners, R. N.

" On the occasion of the last observations which I have made of the solar spots, I have read again what Mr. Grant states, in his *History of Physical Astronomy*, respecting Dr. Wilson's theory of the spots. I think Dr. Wilson is right when he says that the penumbra is made by the slopes of the collapse of luminous matter tending to fill the holes and close up the gaps in the solar atmosphere. The objections made to him that the penumbra is too sharply terminated at the limit from the brilliant part, I think, does not more subsist, after my observations made in the way suggested by Mr. Dawes. I have always seen the structure of the penumbra radiate towards the centre of the nuclei, and, what is very singular, that each radius, or rather streamlet, which composes the penumbra, is equally brilliant as the rest of the luminous body. The penumbra seems to me made by a mixture of streamlets of luminous matter with the dark intervals of the black ground which constitutes the nuclei. So we have an explanation of an almost invariable fact which has been a puzzle to every theory, namely, that the outline which separates the nucleus from the penumbra is similar to the outline which separates the penumbra from the luminous part. As I intend to develope this subject, after some more observations will be made; so, for the present, I will conclude by simply stating, that I do not mean to enter into the theory of the *production* of the spots, but only into that part which belongs to the *description* of them, and so I dare say Dr. Wilson's theory is the best. Sir J. Herschel's views respecting a circulation analogous to our trade-winds being the cause of the solar spots, seems to me to acquire new interest from the fact that the solar equator is hotter than the polar regions.

" The comet of the 6th of March has not been seen more since the 11th of April; and on the 5th I saw a star of the 11th magnitude through it. I would send you some observations of the new planet, but want of space prevents me. I will only add that I am very glad that Mr. Lassell also observed the different colour at the two sides of the black ring of *Saturn*, which I had seen several times last year (see our *Memoirs* for 1851, p. 36).* If the great refractor is ready next year, we shall be able to make some better observations, and to tread the path made by Mr. Lassell.

" *Rome, April* 28, 1853."

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* This volume has not yet been received at the apartments of the Society.—R. G.

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Letter from the Rev. W. R. Dawes to the Editor.

"Some suggestions have been made, and experiments tried, with the hope of imitating some of the phenomena of a total solar eclipse, and thus obtaining a sight of the red projections from the edge of the sun. It is, however, evident, that though the image of the sun itself may be completely and exactly concealed by some contrivance in the eye-piece, or permitted to pass through an aperture into a dark chamber, while the equatoreal movement is regulated precisely to apparent solar time, yet there will remain a great and, I fear, insurmountable obstacle, in the *luminosity of the earth's atmosphere* enlightened by the sun's rays. This difficulty appears to have been overlooked. If a telescope furnished with an eye-piece having a very small field, or half the field covered, be directed to the sky close to the border of the sun, the sun itself being just excluded, the glare is far too powerful to be endured by the eye without the interposition of a pretty deep tint of darkening glass. Such, at least, has been the case under the most favourable circumstances of clear and deep blue sky, during which I have been able to try the experiment.

"In the autumn of 1851, after my return from observing the total solar eclipse in Sweden, it occurred to me that the best chance of obtaining a sight of these phenomena might be afforded by taking advantage of that state of sky, lovely indeed, but too rarely seen in this country, where detached and sharply-defined clouds are slowly moving over the deep blue surface of the heavens. On two or three such occasions, the clock-movement of my equatoreal having been carefully regulated, I watched the passing of well-defined clouds over the sun, which certainly seemed to produce a rather darker tint of sky in the immediate vicinity of the sun's edge than any artificial contrivance in the eye-piece. Yet the advantage gained was not such as to give the slightest hope of success.

"If it is at all possible to render these extremely delicate phenomena visible by artificial means, it will probably be accomplished by erecting a suitable instrument on the top of one of the highest accessible mountains in a fine climate, like that of Oroomiah in Persia, as described by Mr. Stoddard, where the smaller density of the atmosphere and its great dryness exceedingly diminish its illumination by the sun's rays. A telescope of very moderate size might answer the purpose, if equatoreally mounted and driven accurately by clock-work.

"*Wateringbury, May* 6, 1853."

We are requested to state, that the observations on suspected variable light in the letter of the Rev. T. W. Webb, at page 186 of the last number, refer to the star β *Corvi*, not *Coronæ*, as there erroneously stated.

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